

Eureka Math *A Story of Units*

Fourth Grade – Module 5

2015-2016

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Materials based on Eureka Math Version 3.



Module Assessment Overview

Purpose of Assessments

Mid-Module Assessment: These tasks address approximately the **first half** of the module's learning objectives, and provide important information for instruction and for grading.

End-of-Module Assessment: These tasks are based on all standards addressed in order to gauge students' full range of understanding of the **module as a whole**. The End-of-Module assessment should carry more weight than the Mid-Module Assessment in terms of student grades in the appropriate domain.

Administration of Assessments

- Mid- and End-of-Module Assessments are designed to be completed in approximately one class period. However, The tests can be given over multiple days as needed.
- Assessments are designed to be completed independently by students, without assistance.
- These tasks should not be preceded by review of similar problems.

Grading Guidance

The grading scale on Elementary Report Cards has been changed for 2015-2016 and beyond. Please note that ***4 now indicates advanced understanding of grade level standards expected at this time of year.***

- 4 – Advanced:** Student demonstrates advanced understanding of grade level standards expected at this time of year.
- 3 – Proficient:** Student demonstrates proficiency with grade level standards expected at this time of year.
- 2 – Basic:** Student demonstrates basic understanding of grade level standards expected at this time of year. Student needs additional support and practice.
- 1 – Below Basic:** Student demonstrates minimal understanding of grade level standards expected at this time of year. Student needs significant support and practice.

Rubrics have been updated to reflect this change. Rubrics have been further modified from Eureka Math originals for clarity, accuracy, and alignment to Bethel's grade scale.

General Grading Guidance:

- On the report card, student learning is reported by CCSS domain. The Fourth Grade CCSS domains are: Operations and Algebraic Thinking, Number and Operations in Base Ten, Number and Operations – Fractions, Measurement and Data, and Geometry.
- Grades in each domain should be based on multiple sources of evidence, including the Mid- and End-of-Module Assessments. The End-of-Module assessment should carry more weight than the Mid-Module Assessment in terms of student grades in the appropriate domain.

Module 5 Grading Guidance:

- Most of the Module 5 standards will only be taught and assessed in Module 5. 4.MD.2 will be assessed in Modules 6 & 7. (See checklist on page 3.)

Grade 4 Common Core State Standards Checklist by Module

This grade-level chart provides an at-a-glance view of when each standard is addressed. **Shaded boxes indicate standards first assessed in Module 5.** Note that standards included in major clusters are followed by an asterisk (*). Please refer to the Curriculum Overview of *A Story of Units* for a curriculum map and detailed grade-level descriptions including a summary of the year, a rationale of the module sequence, and a standards alignment chart.

CCSS		GRADE 4 MODULES						
		1	2	3	4	5	6	7
4.OA	1*			X				X
	2*			X				X
	3*	X		X				X
	4			X				
	5					X		
4.NBT	1*	X						
	2*	X						
	3*	X						
	4*	X						
	5*			X				X
	6*			X				
4.NF	1*					X		
	2*					X		
	3a*					X		
	3b*					X		
	3c*					X		
	3d*					X		
	4a*					X		
	4b*					X		
	4c*					X		
	5*						X	
	6*						X	
	7*						X	
4.MD	1		X					X
	2		X			X	X	X
	3			X				
	4					X		
	5a				X			
	5b				X			
	6				X			
	7				X			
4.G	1				X			
	2				X			
	3				X			

Assessment Recommendations for Eureka Math A Story of Units
Teaching and Learning Department - Bethel School District

Grade 4 Module 5 Mid-Module Assessment Task Score Sheet

A Progression of Learning

A Progression of Learning is provided to describe steps that illuminate the gradually increasing understandings that students develop *on their way to proficiency*. In this chart, this progress is presented from left to right. The learning goal for each student is to move to the last step, “Evidence of solid reasoning with a correct answer”. These steps are meant to help teachers and students identify and celebrate what the student **CAN** do now, and what they need to work on next.

Score Key: A Progression of Learning			
Little or no evidence of reasoning with an incorrect answer. (1 Point)	Evidence of some reasoning with an incorrect answer. (2 Points)	Evidence of some reasoning with a correct answer or evidence of solid reasoning with an incorrect answer. (3 Points)	Evidence of solid reasoning with a correct answer. (4 Points)

Module 5: Mid-Module Assessment							
Domain		Standards					
Question	Number and Operations – Fractions	4.NF.1	4.NF.2	4.NF.3a	4.NF.3b	4.NF.3d	4.NF.4a
1	1 2 3 4			X	X		X
2	1 2 3 4	X					
3	1 2 3 4	X					
4	1 2 3 4		X				
5	1 2 3 4			X			
6	1 2 3 4	X	X	X	X	X	X

Domain Score	Number and Operations – Fractions	
Total Points		
Level	4	21-24 points
	3	15-20 points
	2	9-14 points
	1	6-8 points

Note: For more information about standards assessed in this module, see back of this score sheet.

Notes:

Grade 4 Module 5 Mid-Module Assessment Task Score Sheet (continued)

Mid-Module Assessment Task (Topics A–D) Clusters and Standards Addressed

Extend understanding of fraction equivalence and ordering.

- 4.NF.1** Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.
- 4.NF.2** Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as $1/2$. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model.

Build fractions from unit fractions by applying and extending previous understandings of operations of whole numbers.

- 4.NF.3** Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$.
- Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
 - Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. *Examples:* $3/8 = 1/8 + 1/8 + 1/8$; $3/8 = 1/8 + 2/8$; $2\ 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8$.
 - Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.
- 4.NF.4** Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.
- Understand a fraction a/b as a multiple of $1/b$. *For example, use a visual fraction model to represent $5/4$ as the product $5 \times (1/4)$, recording the conclusion by the equation $5/4 = 5 \times (1/4)$.*

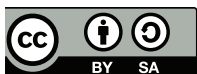
Assessment Recommendations for Eureka Math A Story of Units
Teaching and Learning Department - Bethel School District
Grade 4 Module 5 Mid-Module Assessment Task Rubric

A Progression of Learning				
Assessment Task Item and Standards Assessed	STEP 1 Little or no evidence of reasoning with an incorrect answer. (1 Point)	STEP 2 Evidence of some reasoning with an incorrect answer. (2 Points)	STEP 3 Evidence of some reasoning with a correct answer or evidence of solid reasoning with an incorrect answer. (3 Points)	STEP 4 Evidence of solid reasoning with a correct answer. (4 Points)
1 4.NF.3ab 4.NF.4a	The student correctly answers 0-3 of the eleven parts.	The student correctly answers 4-7 of the eleven parts.	The student correctly answers 8-9 of the eleven parts.	The student correctly answers 10-11 of the eleven parts. (See below.)
	a. Draws and shades to represent the three given fractions and represents each as a sum of unit fractions: i. (1) Draws & shades 1; (2) writes $1 = \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4}$ ii. (3) Draws & shades $\frac{2}{4}$; (4) writes $\frac{2}{4} = \frac{1}{4} + \frac{1}{4}$ iii. (5) Draws & shades $\frac{5}{4}$; (6) writes $\frac{5}{4} = \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4}$ b. Records the decomposition using two addends. (Answers may vary.) i. (7) $1 = \frac{3}{4} + \frac{1}{4}$ iii. (8) $\frac{5}{4} = \frac{3}{4} + \frac{2}{4}$ c. Rewrites equations as multiplication of a whole number: i. (9) $1 = 4 \times \frac{1}{4}$ ii. (10) $\frac{2}{4} = 2 \times \frac{1}{4}$ iii. (11) $\frac{5}{4} = 5 \times \frac{1}{4}$			
2 4.NF.1	The student correctly answers 0-1 of the six parts.	The student correctly answers 2-3 of the six parts.	The student correctly answers 4-5 of the six parts.	The student correctly answers 6 of the six parts. (See below.)
	a. (1-4) Identifies the shaded fractions as: $\frac{1}{2}, \frac{2}{4}, \frac{3}{6}, \frac{4}{8}$ and (5) creates a correct model to represent $\frac{4}{8}$. b. (6) Uses multiplication to explain why $\frac{1}{2}$ and $\frac{2}{4}$ are equivalent: $\frac{1 \times 2}{2 \times 2} = \frac{2}{4}$			
3 4.NF.1	The student correctly answers 0-1 of the six parts.	The student correctly answers 2-3 of the six parts.	The student correctly answers 4-5 of the six parts.	The student correctly answers 6 of the six parts. (See below.)
	a. (1) $\frac{6}{5}$; (2) explanation b. (3) $\frac{8}{4}$; (4) explanation c. (5) $\frac{16}{12}$; (6) explanation			



Assessment Recommendations for Eureka Math A Story of Units
Teaching and Learning Department - Bethel School District

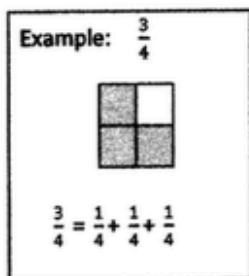
A Progression of Learning				
Assessment Task Item and Standards Assessed	STEP 1 Little or no evidence of reasoning with an incorrect answer. (1 Point)	STEP 2 Evidence of some reasoning with an incorrect answer. (2 Points)	STEP 3 Evidence of some reasoning with a correct answer or evidence of solid reasoning with an incorrect answer. (3 Points)	STEP 4 Evidence of solid reasoning with a correct answer. (4 Points)
4 4.NF.2	The student correctly answers 0-6 of the sixteen parts.	The student correctly answers 7-11 of the sixteen parts.	The student correctly answers 12-14 of the sixteen parts.	The student correctly answers 15-16 of the sixteen parts. (See below.)
	a. (1) > (2) justification b. (3) > (4) justification c. (5) = (6) justification d. (7) < (8) justification e. (9) > (10) justification f. (11) = (12) justification g. (13) < (14) justification h. (15) < (16) justification			
5 4.NF.3a	The student correctly completes 0-3 of the 12 parts.	The student correctly completes 4-7 of the 12 parts.	The student correctly completes 8-10 of the twelve parts.	The student correctly completes all 11-12 of the twelve parts. (See below.)
	a. (1) $\frac{11}{12}$ and (2) model b. (3) $\frac{26}{100}$ and (4) model c. (5) $\frac{4}{12}$ and (6) model d. (7) $\frac{11}{10}$ and (8) model e. (9) $\frac{3}{8}$ and (10) model f. (11) $\frac{4}{8}$ and (12) model			
6 4.NF.1 4.NF.2 4.NF.3abd 4.NF.4a	The student correctly 0-2 of the eight parts.	The student correctly completes 3-5 of the eight parts.	The student correctly completes 6-7 of the eight parts.	The student correctly completes 8 of the eight parts. (See below.)
	a. (1) Answers $\frac{1}{6}$ and (2) writes an equation and (3) draws a model. b. (4) Accurately explains through words and/or pictures that the two fractions in question refer to two different size wholes. The water bottle that is half full could be a larger bottle. c. (5) Answers $\frac{16}{8}$ or 2 containers. d. (6) Answers $\frac{8}{8} = 8 \times \frac{1}{8}$. e. (7) Answers $\frac{6}{8} = \frac{6 \div 2}{8 \div 2} = \frac{3}{4}$ and (8) uses a tape diagram, number line, or area model to model the division.			



Assessment Recommendations for Eureka Math A Story of Units
Teaching and Learning Department - Bethel School District
Grade 4 Module 5 Mid-Module Assessment Task Key

Name Jack Date _____

1. Let each small square represent $\frac{1}{4}$.
- a. Using the same unit, draw and shade the following fractions.
Represent each as a sum of unit fractions.

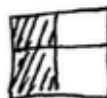


i. 1



$$1 = \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4}$$

ii. $\frac{2}{4}$



$$\frac{2}{4} = \frac{1}{4} + \frac{1}{4}$$

iii. $\frac{5}{4}$



$$\frac{5}{4} = \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4}$$

- b. Record the decompositions of Parts (i) and (iii) using only 2 addends.

i. $1 = \frac{2}{4} + \frac{2}{4}$

iii. $\frac{5}{4} = \frac{2}{4} + \frac{3}{4}$

- c. Rewrite the equations from Part (a) as the multiplication of a whole number by a unit fraction.

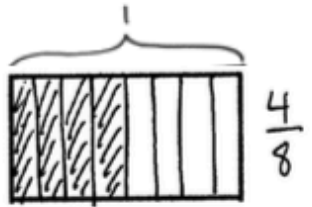
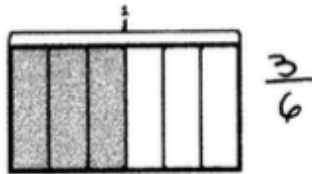
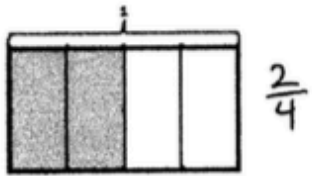
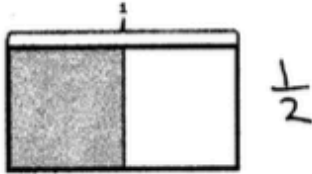
i. $1 = 4 \times \frac{1}{4}$

ii. $\frac{2}{4} = 2 \times \frac{1}{4}$

iii. $\frac{5}{4} = 5 \times \frac{1}{4}$

Grade 4 Module 5 Mid-Module Assessment Task Key (continued)

2. a. Using the fractional units shown, identify the fraction of the rectangle that is shaded. Continue this pattern by drawing the next area model in the sequence and identifying the fraction shaded.



- b. Use multiplication to explain why the first two fractions are equivalent.

$$\frac{1}{2} = \frac{2}{4}$$

$$\frac{1 \times 2}{2 \times 2} = \frac{2}{4}$$

3. Cross out the fraction that is not equivalent to the other three. Show how you know.

a. $\frac{3}{5}$ $\frac{60}{100}$ $\frac{6}{10}$ ~~$\frac{6}{5}$~~

$$\frac{3 \times 20}{5 \times 20} = \frac{60}{100}$$

$$\frac{6 \times 10}{10 \times 10} = \frac{60}{100}$$

$$\frac{3}{5} \text{ does not equal } \frac{6}{5}$$

b. $\frac{6}{4}$ $\frac{3}{2}$ $\frac{12}{8}$ ~~$\frac{8}{4}$~~

$$\frac{3 \times 4}{2 \times 4} = \frac{12}{8}$$

$$\frac{6 \times 2}{4 \times 2} = \frac{12}{8}$$

$$\frac{6}{4} \text{ does not equal } \frac{8}{4}$$

c. $\frac{6}{4}$ ~~$\frac{6}{12}$~~ $\frac{9}{6}$ $\frac{3}{2}$

$$\frac{3 \times 3}{2 \times 3} = \frac{9}{6}$$

$$\frac{3 \times 2}{2 \times 2} = \frac{6}{4}$$

$$\frac{3 \times 6}{2 \times 6} = \frac{18}{12} \quad \frac{18}{12} \text{ does not equal } \frac{16}{12}$$

Grade 4 Module 5 Mid-Module Assessment Task Key (continued)

4. Fill in the circle with $<$, $=$, or $>$ to make a true number sentence. Justify each response by drawing a model (such as an area model or number line), creating common denominators or numerators, or explaining a comparison to a benchmark fraction.

a. $\frac{6}{5} > \frac{4}{5}$

With the same whole, six fifths is more than four fifths.

b. $\frac{5}{8} > \frac{5}{10}$

With the same size whole, tenths are smaller than eighths. Five tenths are less than five eighths.

c. $\frac{5}{5} = \frac{12}{12}$

Both fractions are equal to 1 whole.

d. $\frac{5}{12} < \frac{6}{10}$

$\frac{5}{12}$ is less than $\frac{1}{2}$.

$\frac{6}{10}$ is greater than $\frac{1}{2}$.

e. $\frac{5}{6} > \frac{3}{4}$

$\frac{5}{6}$ is only $\frac{1}{6}$ from one whole.

$\frac{3}{4}$ is $\frac{1}{4}$ from one whole, so

$\frac{5}{6} > \frac{3}{4}$ since $\frac{5}{6}$ is closer to one whole.

f. $\frac{8}{3} = \frac{16}{6}$

$$\frac{8 \times 2}{3 \times 2} = \frac{16}{6}$$

g. $\frac{7}{4} < \frac{9}{5}$

$$\frac{7}{4} = \frac{3}{4} + \frac{4}{4}$$

$\frac{3}{4}$ is $\frac{1}{4}$ from one whole.

$\frac{4}{5}$ is $\frac{1}{5}$ from one whole.

$\frac{3}{4} < \frac{4}{5}$ since $\frac{3}{4}$ is further from one whole.

$$\frac{7}{4} < \frac{9}{5}$$

h. $\frac{12}{8} < \frac{11}{6}$

$$\frac{12}{8} = 1 \frac{4}{8} = 1 \frac{1}{2}$$

$$\frac{12}{8} = \frac{3}{2} + \frac{4}{8}$$

$$\frac{11}{6} = 1 \frac{5}{6}$$

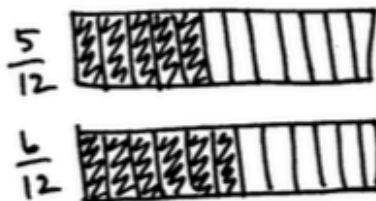
$$\frac{11}{6} = \frac{10}{6} + \frac{1}{6}$$

$\frac{5}{6}$ is closer to 1 whole than $\frac{1}{2}$.

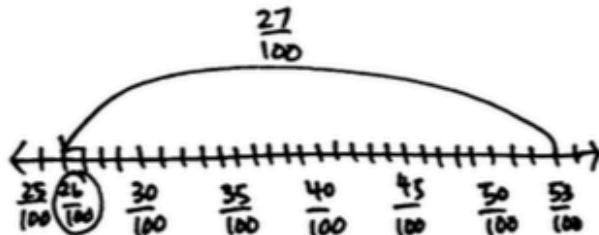
Grade 4 Module 5 Mid-Module Assessment Task Key (continued)

5. Fill in the blanks to make each number sentence true. Draw a number line, tape diagram, or area model to represent each problem.

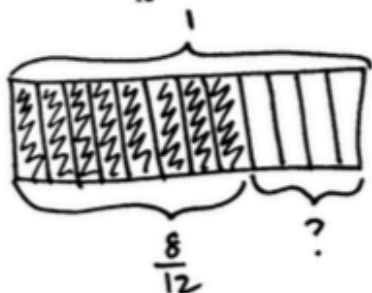
a. $\frac{11}{12} = \frac{5}{12} + \frac{6}{12}$



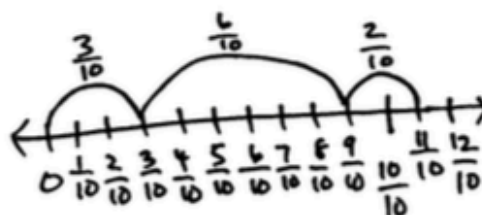
b. $\frac{53}{100} - \frac{27}{100} = \frac{26}{100}$



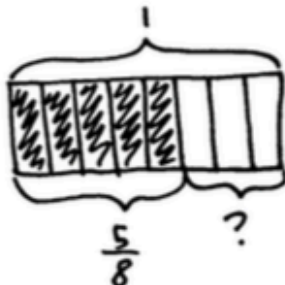
c. $\frac{8}{12} + \frac{4}{12} = 1$



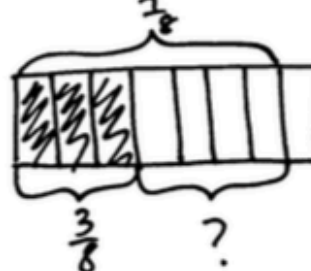
d. $\frac{3}{10} + \frac{6}{10} + \frac{2}{10} = \frac{11}{10}$



e. $1 - \frac{5}{8} = \frac{3}{8}$ $\frac{8}{8} - \frac{5}{8} = ?$



f. $\frac{7}{8} - \frac{3}{8} = \frac{4}{8}$



Grade 4 Module 5 Mid-Module Assessment Task Key (continued)

6. Ray, Robin, and Freddy went fishing.

- a. They spent $\frac{1}{6}$ of their money on water, $\frac{4}{6}$ of their money on lunch, and the rest on worms. What fraction of their money was spent on worms? Draw a model and write an equation to solve.



$$\frac{1}{6} + \frac{4}{6} + \frac{1}{6} = \frac{6}{6} = 1$$

They spent $\frac{1}{6}$ of their money on worms.

- b. Robin noticed her water bottle was $\frac{1}{2}$ full and Freddy's was $\frac{3}{4}$ full. Robin said, "My $\frac{1}{2}$ full bottle has more water than your $\frac{3}{4}$ full bottle." Explain how $\frac{1}{2}$ bottle could be more than $\frac{3}{4}$ bottle.

If Robin's water bottle was bigger than Freddy's, half of her water bottle could be more than $\frac{3}{4}$ of his.

- c. Ray, Robin, and Freddy each had identical containers of worms. Ray used $\frac{3}{8}$ container. Robin used $\frac{6}{8}$ container, and Freddy used $\frac{7}{8}$ container. How many total containers of worms did they use?

$$\frac{3}{8} + \frac{6}{8} + \frac{7}{8} = \frac{16}{8} = 2$$

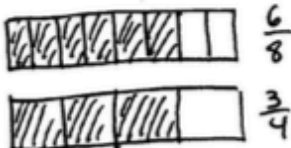
They used 2 containers of worms.

- d. Express the number of remaining containers as a product of a whole number and a unit fraction.

$$\frac{8}{8} = 8 \times \frac{1}{8}$$

- e. Six out of the eight fish they caught were trout. What is another fraction equal to 6 eighths? Write a number sentence and draw a model to show the two fractions are equal.

$$\frac{6}{8} = \frac{3}{4}$$



$$\frac{3 \times 2}{4 \times 2} = \frac{6}{8}$$

Grade 4 Module 5 End-of-Module Assessment Task Score Sheet

A Progression of Learning

A Progression of Learning is provided to describe steps that illuminate the gradually increasing understandings that students develop *on their way to proficiency*. In this chart, this progress is presented from left to right. The learning goal for each student is to move to the last step, “Evidence of solid reasoning with a correct answer”. These steps are meant to help teachers and students identify and celebrate what the student CAN do now, and what they need to work on next.

Score Key: A Progression of Learning

Little or no evidence of reasoning with an incorrect answer. (1 Point)	Evidence of some reasoning with an incorrect answer. (2 Points)	Evidence of some reasoning with a correct answer or evidence of solid reasoning with an incorrect answer. (3 Points)	Evidence of solid reasoning with a correct answer. (4 Points)
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Module 5: End-of-Module Assessment									
Question	Domain			Standards					
	Operations and Algebraic Thinking	Number and Operations – Fractions		Measurement and Data	4.OA.5	4.NF.1	4.NF.2	4.NF.3	4.NF.4
1		1	2	3	4				X
2		1	2	3	4		X	X	
3	1	2	3	4		X			
4		1	2	3	4			X	
5		1	2	3	4				X
6		1	2	3	4			X	X
7 a, b				1	2	3	4		X
7 c, e		1	2	3	4		X	X	
7 d, f		1	2	3	4			X	X
7g	1	2	3	4		X			

Domain Score	Operations and Algebraic Thinking		Number and Operations – Fractions		Measurement and Data	
Total Points						
Level	4	7-8 pts.	4	25-28 pts.	4	4 pts.
	3	5-6 pts.	3	18-24 pts.	3	3 pts.
	2	3-4 pts.	2	11-17 pts.	2	2 pts.
	1	2 pts.	1	7-10 pts.	1	1 pts.

Notes:

Grade 4 Module 5 End-of-Module Assessment Score Sheet (continued)**End-of-Module Assessment Task (Topics A-H)
Clusters and Standards Addressed****Generate and analyze patterns.**

- 4.OA.5** Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. *For example, given the rule “Add 3” and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.*

Extend understanding of fraction equivalence and ordering.

- 4.NF.1** Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.
- 4.NF.2** Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as $1/2$. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model.

Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.

- 4.NF.3** Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$.
- Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.
 - Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. *Examples: $3/8 = 1/8 + 1/8 + 1/8$; $3/8 = 1/8 + 2/8$; $2\ 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8$.*
 - Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.
 - Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.
- 4.NF.4** Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.
- Understand a fraction a/b as a multiple of $1/b$. *For example, use a visual fraction model to represent $5/4$ as the product $5 \times (1/4)$, recording the conclusion by the equation $5/4 = 5 \times (1/4)$.*
 - Understand a multiple of a/b as a multiple of $1/b$, and use this understanding to multiply a fraction by a whole number. *For example, use a visual fraction model to express $3 \times (2/5)$ as $6 \times (1/5)$, recognizing this product as $6/5$. (In general, $n \times (a/b) = (n \times a)/b$.)*
 - Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. *For example, if each person at a party will eat $3/8$ of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?*

Represent and interpret data.

- 4.MD.4** Make a line plot to display a data set of measurements in fractions of a unit ($1/2$, $1/4$, $1/8$). Solve problems involving addition and subtraction of fractions by using information presented in line plots. *For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.*

Assessment Recommendations for Eureka Math A Story of Units
Teaching and Learning Department - Bethel School District

Grade 4 Module 5 End-of-Module Assessment Rubric

A Progression of Learning				
Assessment Task Item and Standards Assessed	STEP 1 Little or no evidence of reasoning with an incorrect answer. (1 Point)	STEP 2 Evidence of some reasoning with an incorrect answer. (2 Points)	STEP 3 Evidence of some reasoning with a correct answer or evidence of solid reasoning with an incorrect answer. (3 Points)	STEP 4 Evidence of solid reasoning with a correct answer. (4 Points)
1 4.NF.4ab	The student correctly answers 0 of the three parts.	The student correctly answers 1 of the three parts.	The student correctly answers 2 of the 3 parts.	The student correctly answers 3 of the 3 parts. (See below.)
	a. Partitions the (1) tape diagram and (2) number line. b. (3) Explains the equivalence using the models and number sentences.			
2 4.NF.1 4.NF.2	The student correctly answers 0-1 of the six parts.	The student correctly answers 2-3 of the six parts.	The student correctly answers 4-5 of the six parts.	The student correctly answers 6 of the six parts. (See below.)
	a. (1) < and (2) justification b. (3) = and (4) justification c. (5) < and (6) justification			
3 4.OA.5	The student correctly answers 0 of the three parts.	The student correctly answers 1 of the three parts.	The student correctly answers 2 of the three parts. Note: Allow for correct answers in parts (2) and (3) based on incorrect work in part (1).	The student correctly answers 3 of the three parts. (See below)
	(1) Generates the following pattern: $\frac{1}{3}, \frac{5}{3}, \frac{9}{3}, \frac{13}{3}, \frac{17}{3}, \frac{21}{3}, \frac{25}{3}, \frac{29}{3}, \frac{33}{3}, \frac{37}{3}, \frac{41}{3}, \frac{45}{3}, \frac{49}{3}, \frac{53}{3}, \frac{57}{3}$ (2) Circles $\frac{9}{3}, \frac{21}{3}, \frac{33}{3}, \frac{45}{3}, \frac{57}{3}$. (3) Observes that whole numbers repeat every three fractions, determines that all whole numbers are odd numbers (3, 7, 11, 15, 19), or provides another acceptable response.			
4 4.NF.3c	The student correctly evaluates 0-1 of the four expressions.	The student correctly evaluates 2 of the four expressions.	The student correctly evaluates 3 of the four expressions.	The student correctly evaluates 4 of the four expressions. (See below)
	a. (1) $14\frac{1}{10}$ b. (2) $11\frac{7}{8}$ c. (3) $\frac{5}{12}$ d. (4) $3\frac{4}{5}$			
5 4.NF.4ab	The student correctly rewrites or solves 0-1 of the four parts.	The student correctly rewrites or solves 2 of the four parts.	The student correctly rewrites and solves 3 of the four parts.	The student correctly rewrites and solves 4 of the four parts. (See below.)
	a. (1) rewrites as $18 \times \frac{1}{8}$ and (2) solves $\frac{18}{8}$ or $2\frac{2}{8}$ b. (3) rewrites as $80 \times \frac{1}{3}$ and (4) solves $\frac{80}{3}$ or $26\frac{2}{3}$			



Assessment Recommendations for Eureka Math A Story of Units
Teaching and Learning Department - Bethel School District

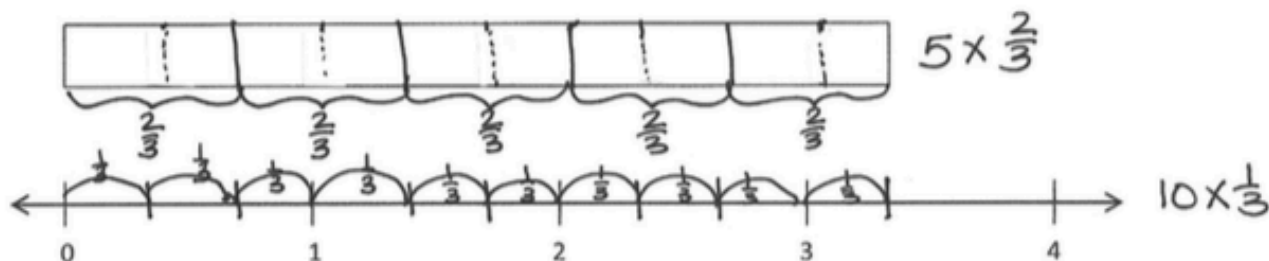
A Progression of Learning				
Assessment Task Item and Standards Assessed	STEP 1 Little or no evidence of reasoning with an incorrect answer. (1 Point)	STEP 2 Evidence of some reasoning with an incorrect answer. (2 Points)	STEP 3 Evidence of some reasoning with a correct answer or evidence of solid reasoning with an incorrect answer. (3 Points)	STEP 4 Evidence of solid reasoning with a correct answer. (4 Points)
6 4.NF.3a 4.NF.4b	The student correctly answers 0-3 of the twelve parts.	The student correctly answers 4-7 of the twelve parts.	The student correctly answers 8-10 of the twelve parts.	The student correctly answers 11-12 of the twelve parts. (See below.)
	a. (1) True and (2) Explanation b. (3) True and (4) Explanation c. (5) True and (6) Explanation d. (7) False, (8) $\frac{11}{3} = 11 \times \frac{1}{3}$ (Accept revised number sentence as explanation; answers may vary) e. (9) True and (10) Explanation f. (11) False, and (12) $5 \times 3\frac{3}{4} = 5 \times (3 + \frac{3}{4})$ (Accept revised number sentence as explanation; answers may vary)			
7 a, b 4.MD.4	The student is unable to create a line plot or find the difference.	The student: a. Creates a line plot with up to 7 data points from the table. OR b. Finds the difference 1 $\frac{5}{8}$ inches.	The student correctly: a. Creates a line plot with 8-9 data points from the table. b. Finds the difference 1 $\frac{5}{8}$ inches.	The student correctly: a. Creates an accurate line plot with 10 data points from the table. b. Finds the difference 1 $\frac{5}{8}$ inches.
7 c, e 4.NF.1 4.NF.2	The student correctly answers 0 of the 3 parts.	The student correctly answers 1 of the 3 parts.	The student correctly answers 2 of the 3 parts.	The student correctly answers 3 of the three parts. (See below.)
	c. (1) Shows $3\frac{1}{2} = 3\frac{2}{4} = 3\frac{4}{8}$ using a model or showing equivalences through expressions. e. (2) $2\frac{5}{8} > 2\frac{1}{2}$ and (3) Shows work			
7 d, f 4.NF.3	The student correctly answers 0-1 of the three parts.	The student correctly answers 2-3 of the three parts.	The student correctly answers 4 of the three parts.	The student correctly answers 5 of the three parts. (See below.)
	d. (1) No; the two butterflies will not fit. (2) Writes an equation and (3) explains that the combined wingspan is $6\frac{1}{8}$, which is longer than the box. f. (4) answers $11\frac{7}{8}$ inches and (5) shows work.			
7 g 4.OA.5	The student correctly answers 0-3 of the nine parts.	The student correctly answers 4-6 of the nine parts.	The student correctly answers 7-8 of the nine parts.	The student correctly answers 9 of the nine parts. (See below.)
	(1-4) Generates the pattern: $2\frac{3}{8}, 2\frac{1}{2}(2\frac{4}{8}), 2\frac{5}{8}, 2\frac{6}{8}$ (5-9) Names butterflies: Purple Spotted Swallowtail, Southern Dogface, Zebra Swallowtail, Milbert's Tortoiseshell, and Viceroy.			



Grade 4 Module 5 End-of-Module Assessment Task Key

Name Jack Date _____

1. a. Partition the tape diagram to show $5 \times \frac{2}{3}$. Partition the number line to show $10 \times \frac{1}{3}$.



- b. Use the models above to explain why $5 \times \frac{2}{3} = 10 \times \frac{1}{3}$.

When you double the size of the piece, you only need half as many to be the same length.

2. Fill in the circles below with $<$, $=$, or $>$ to make true number sentences. Use decomposition or multiplication to justify your answer.

a. $7 \bigcirc \frac{43}{6}$ $\frac{43}{6} = 7 \times \frac{6}{6} + \frac{1}{6} = 7 \frac{1}{6}$

b. $11 \frac{1}{3} \bigcirc \frac{34}{3}$ $\frac{34}{3} = 11 \times \frac{3}{3} + \frac{1}{3} = 11 \frac{1}{3}$

c. $\frac{13}{6} \bigcirc \frac{38}{12}$ $\frac{13}{6} \times 2 = \frac{26}{12}$ $\frac{26}{12} < \frac{38}{12}$

Grade 4 Module 5 End-of-Module Assessment Task Key (continued)

3. Generate a pattern of at least 13 fractions by adding $\frac{4}{3}$ to $\frac{1}{3}$ and then continuing to add $\frac{4}{3}$ to each fraction. Circle each fraction equal to a whole number. Write what you notice about the pattern of whole numbers. The first two fractions are written for you.

$$\frac{1}{3}, \frac{5}{3}, \left(\frac{9}{3}\right), \frac{13}{3}, \frac{17}{3}, \left(\frac{21}{3}\right), \frac{25}{3}, \frac{29}{3}, \left(\frac{33}{3}\right), \frac{37}{3}, \frac{41}{3}, \left(\frac{45}{3}\right), \frac{49}{3}, \frac{53}{3}, \left(\frac{57}{3}\right)$$

3 7 11 15 19

I noticed that the pattern of the whole numbers increases by 4 each time and they are all odd numbers.

4. Find each sum or difference.

a. $6\frac{4}{10} + 7\frac{7}{10} = 14\frac{1}{10}$

$$6 + 7 = 13$$

$$\frac{4}{10} + \frac{7}{10} = \frac{11}{10} = 1\frac{1}{10}$$

$$13 + 1\frac{1}{10} = 14\frac{1}{10}$$

b. $3\frac{3}{8} + 6\frac{5}{8} + 1\frac{7}{8} = 11\frac{7}{8}$

$$3 + 6 + 1 = 10$$

$$\frac{3}{8} + \frac{5}{8} + \frac{7}{8} = \frac{15}{8} = 1\frac{7}{8}$$

$$10 + 1\frac{7}{8} = 11\frac{7}{8}$$

c. $1\frac{9}{12} - 1\frac{4}{12} = \frac{5}{12}$

$$1 - 1 = 0$$

$$\frac{9}{12} - \frac{4}{12} = \frac{5}{12}$$

d. $5\frac{2}{5} - 1\frac{3}{5} = 3\frac{4}{5}$

$$5\frac{2}{5} = 4\frac{7}{5}$$

$$\begin{array}{l} 4 - 1 = 3 \\ \frac{7}{5} - \frac{3}{5} = \frac{4}{5} \end{array} \left. \vphantom{\begin{array}{l} 4 - 1 = 3 \\ \frac{7}{5} - \frac{3}{5} = \frac{4}{5} \end{array}} \right\} 3\frac{4}{5}$$

Grade 4 Module 5 End-of-Module Assessment Task Key (continued)

5. a. Rewrite $3 \times \frac{6}{8}$ as the product of a unit fraction and a whole number. Solve.


$$3 \times \frac{6}{8} = 18 \times \frac{1}{8} = \frac{18}{8} = \frac{8}{8} + \frac{8}{8} + \frac{2}{8} = 1 + 1 + \frac{2}{8} = 2\frac{2}{8}$$

- b. Rewrite $4 \times 6\frac{2}{3}$ as the product of a unit fraction and a whole number. Solve

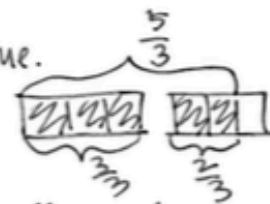
$$4 \times 6\frac{2}{3} = 4 \times \frac{20}{3} = \frac{4 \times 20}{3} = 80 \times \frac{1}{3} = \frac{80}{3} = 26\frac{2}{3}$$

6. Determine if the following are true or false. Explain how you know using models or words. Make false problems true by rewriting the right side of the number sentence.

a. $7\frac{1}{3} = 7 + \frac{1}{3}$

True. 

b. $\frac{5}{3} = \frac{3}{3} + \frac{2}{3}$

True. 

c. $\frac{13}{6} - \frac{5}{6} = \frac{13-5}{6}$

True.

$\frac{13-5}{6}$ is the same as $\frac{13}{6} - \frac{5}{6}$

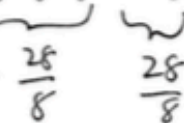
d. $\frac{11}{3} = 11 + \frac{1}{3}$

False. $\frac{11}{3} = 11 \times \frac{1}{3}$

$11 + \frac{1}{3} = 11\frac{1}{3}$

$\frac{11}{3} \neq 11\frac{1}{3}$

e. $\frac{7}{8} + \frac{7}{8} + \frac{7}{8} + \frac{7}{8} = 4 \times \frac{7}{8}$

True. 

f. $5 \times 3\frac{3}{4} = 15 + \frac{3}{4} \rightarrow 5 \times 3\frac{3}{4} = 5 \times (3 + \frac{3}{4})$

$5 \times \frac{15}{4} = 75 \times \frac{1}{4} = \frac{75}{4} = 18\frac{3}{4}$

False. $18\frac{3}{4} \neq 15\frac{3}{4}$

Grade 4 Module 5 End-of-Module Assessment Task Key (continued)

7. The chart to the right shows data Amashi collected about butterfly wingspans.

- a. At the bottom of this page, create a line plot to display the data in the table.

- b. What is the difference in wingspan between the widest and narrowest butterflies on the chart?

$$3\frac{7}{8} \text{ inches} - 2\frac{3}{8} \text{ inches} = 1\frac{4}{8} \text{ inches}$$

$$3 - 2 = 1$$

$$\frac{7}{8} - \frac{3}{8} = \frac{4}{8}$$

- c. Three butterflies have the same wingspan. Explain how you know the measurements are equal.

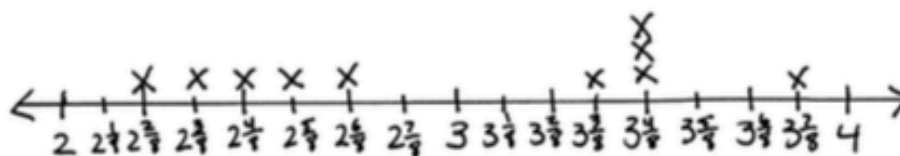
The Julia, Tiger Swallowtail, and Regal Fritillary all have the same wingspan. I know because

$$3\frac{2}{4} = 3\frac{1}{2} = 3\frac{2}{4}$$

$$\frac{1 \times 2}{2 \times 2} = \frac{2 \times 2}{4 \times 2} = \frac{4}{8}$$

Butterfly	Wingspan (inches)
Monarch	$3\frac{7}{8}$
Milbert's Tortoiseshell	$2\frac{5}{8}$
Zebra Swallowtail	$2\frac{1}{2}$
Viceroy	$2\frac{6}{8}$
Postman	$3\frac{3}{8}$
Purple Spotted Swallowtail	$2\frac{2}{8}$
Julia	$3\frac{2}{4}$
Southern Dogface	$2\frac{3}{8}$
Tiger Swallowtail	$3\frac{1}{2}$
Regal Fritillary	$3\frac{4}{8}$

Wingspans of Butterflies



Wingspan (inches)

x = 1 butterfly

Grade 4 Module 5 End-of-Module Assessment Task Key (continued)

Solve each problem. Draw a model, write an equation, and write a statement for each.

- d. Amashi wants to display a Postman and Viceroy side by side in a photo box with a width of 6 inches. Will these two butterflies fit? Explain how you know.

Postman $3\frac{3}{8}$ inches $3\frac{3}{8}$ inches + $2\frac{6}{8}$ inches = $5\frac{9}{8}$ inches = $6\frac{1}{8}$ inches

Viceroy $2\frac{6}{8}$ inches

$\begin{array}{c} \frac{9}{8} \\ \swarrow \searrow \\ \frac{8}{8} \quad \frac{1}{8} \end{array}$

The two butterflies will not fit because when I added their wingspans together I got $6\frac{1}{8}$ inches which is greater than 6 inches.

- e. Compare the wingspan of the Milbert's Tortoiseshell and the Zebra Swallowtail using $>$, $<$, or $=$.

$2\frac{5}{8}$ inches $>$ $2\frac{1}{2}$ inches

Milbert's Tortoiseshell Zebra Swallowtail

$\frac{1 \times 4}{2 \times 4} = \frac{4}{8}$
 $2\frac{1}{2} = 2\frac{4}{8}$

The Milbert's Tortoiseshell has a larger wingspan than the Zebra Swallowtail.

- f. The Queen Alexandra Birdwing can have a wingspan that is 5 times as wide as the Southern Dogface's. How many inches can the Birdwing's wingspan be?

$5 \times 2\frac{3}{8} = (5 \times 2) + (5 \times \frac{3}{8}) = 10 + \frac{15}{8} = 10 + \frac{15}{8} = 11\frac{7}{8}$

$\begin{array}{c} \frac{15}{8} \\ \swarrow \searrow \\ \frac{8}{8} \quad \frac{7}{8} \end{array}$

The Queen Alexandra Birdwing's wingspan can be $11\frac{7}{8}$ inches.

- g. Amashi discovered a pattern. She started with $2\frac{2}{8}$ inches and added $\frac{1}{8}$ inch to each measurement. List the next four measurements in her pattern. Name the five butterflies whose wingspans match the measurements in her pattern.

$2\frac{2}{8}$ inches, $2\frac{3}{8}$ inches, $2\frac{4}{8}$ inches, $2\frac{5}{8}$ inches, $2\frac{6}{8}$ inches

Purple Spotted Swallowtail Southern Dogface Zebra Swallowtail Milbert's Tortoiseshell Viceroy